CONVEX REFLEXIVE LATTICE POLYGONS AND THE NUMBER 12

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Abstract

A lattice polygon is a polygon with integral vertices in $\mathbb{R}^2$. This means that its vertices are of the form (a, b), where a and b are integers. A reflexive lattice polygon has the property that the origin $(0, 0)$ is the unique integral interior point of the polygon. These polygons have duals, which are also reflexive lattice polygons. Today I will present a curious relation between convex reflexive lattice polygons, their duals, and the number 12. I will explain how this relation has deep connections with toric varieties, forming a bridge between two beautiful areas in mathematics: combinatorics and algebraic geometry.

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